METHODOLOGIES AND STRATEGIES FOR ENHANCING THE UNDERGRADUATE EXPERIENCE FOR BA/BSC PRODUCT DESIGN STUDENTS THROUGH COLLABORATIONS WITH DESIGNER MORITZ WALDEMEYER

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Abstract

This paper examines methodologies and strategies used to enhance learning and the Undergraduate experience for BA(Hons) and BSc(Hons) Product Design students. Specifically, it details a number of projects in collaboration with an external designer, (Waldemeyer) Moritz Waldemeyer and how this has led to enhanced student experiences and high profile work opportunities both during studies and upon graduation.

This includes work with Mercedes, Ellie Goulding, Take That, Electrabel, Laikingland and The Olympic Closing Ceremony and Paralympics, 2012.

The paper describes the progression of Waldemeyer from a one-off guest lecturer to becoming a visiting lecturer at Middlesex University facilitating a live Design Project as part of the curriculum along with Laikingland. This led to the placement of students on commercial projects outside of the University and finally, to Waldemeyer becoming a Designer in Residence.

The paper demonstrates how the live projects motivated the partaking students to develop vital skills leading to a high proportion of high level degree outcomes. Their increased confidence and competency on working to live deadlines has led to a number of them setting up or working in successful design studios, launching products on Kickstarter and being taken on as Graduate Teaching Assistants at Middlesex University.

Techniques such as presentation and visualisation skills, thinking on the job, iterative prototyping, physical computing skills and group work contributed to the success of this approach alongside encouragement and facilitation from the participating tutors.

Keywords: Innovation, creativity, Product Design, shared learning, technology, motivation, student experience, live projects, internships.

1 INTRODUCTION

> *Studies in a wide variety of disciplines emphasize the many advantages of internships and cooperative education experiences [e.g, Maskooki, Rama & Raghunandan, 1998, p.75; Kelly, 2007, p.10; Beard, 1998, p. 507-08]. (cited in [1])*
>
> *It is to be expected that internships will increasingly turn into a core interest for the higher education sector…… A number of internationally important university rankings, such as ….The Times Good University Guide in the UK, include indicators of postgraduate career success (Clarke, 2007)……..driven by an employability agenda. If internships have a direct causal effect on career indicators, universities are well advised to invest in internships alongside traditional, academic teaching and training. [2]*

This paper describes the evolving relationship between an external designer, Waldemeyer (Moritz Waldemeyer) and a group of BA(Hons) and BSc(Hons)Product Design students working on the joint Design Projects module at Middlesex University [3]. It shows how an initial contact developed into an ongoing co-operation, where student experience was enhanced by internships with an external designer and gave the students opportunities they would not normally have had at University. It describes this process of the development of the collaboration with Waldemeyer and shows how the activities that the students were involved in with him align with the learning outcomes expected from Levels 4, 5 and 6 (first, second and third year of Undergraduate study) and also Level 7 (Postgraduate level).

The paper will describe the role that students had for each internship project, demonstrating that as they became more highly trained through their Product Design training, they were able to tackle more ambitious outcomes and were able to work autonomously and project manage, gaining awareness of commercial best practice in the process.

The students involved were sent an informal questionnaire [4] three years after graduation in order to reflect on the usefulness of their experiences on live projects with Waldemeyer. Students were asked to reflect on the following themes:

- the projects worked on with Waldemeyer and their role on each live projects
- how their training at Middlesex University had been applied in their roles on the live projects
- what new skills they had learnt on each live project and how this had developed
- how this had affected their confidence and abilities to work autonomously as a designer at University especially in their final year
- what grade they had achieved for their Undergraduate degree after taking part in the live projects
- if their employability success was aided through having Waldemeyer and the live projects on their CVs
- what jobs they had had since graduation
- to reflect on the importance of live projects whilst at University with the hindsight of three years since graduation.

An important part of this paper is the reflections of those students to measure the impact of the live projects on their employability rates.

Initial contact with Waldemeyer was established through a member of the Product Design teaching staff at Middlesex University, Jedwab (Debora Jedwab), attending the Maarten Baas Boisbuchet Summer Workshop in Western France organised by the Vitra Museum (Basel). Waldemeyer was part of the teaching staff at the workshops and she met him over a campfire one evening, chatting about the work of the University. He was invited, as a consequence of this conversation, to come into the University to give a guest lecture as part of a series of twenty visiting guest lecturers from all fields of design for the module Product Design in Context.

Waldemeyer was invited back to work with us because the lecture was well received, because he was given a tour of the facilities in order to draw him in and because he was then invited to take part in an intra-curricular live design project with our students (along with Martin Smith of Laikingland), as part of the Design Projects module. A crucial part of the collaboration with Waldemeyer was the cultivation of a good working relationship with and a good rapport between Waldemeyer and Jedwab and Zivanovic and the rest of the teaching staff and technicians at Middlesex University.

Jedwab was also the placement officer for Product Design at the time, meaning that she was responsible for liaising with students on internships and placement with employers, sometimes on long placements over a year and at other times, on a number of short placements. The link with Waldemeyer allowed her to capitalize on this industry contact in order to facilitate a number of students taking part in extra-curricular projects with Waldemeyer (the live projects). Amongst others, examples of this were an advertisement for Mercedes CLS with Waldemeyer and a series of ever more ambitious projects that evolved from this, culminating in an opportunity to take part in the London Olympics Closing Ceremony and the Paralympics 2012. Corporate Marketing and Communications at Middlesex University widely publicized the live projects in collaboration with the teaching staff. Further opportunities were gleaned through contact with Waldemeyer including The Listening Chair with Imogen Heap and a robotic arm for Ted Noten via Smith (Martin Smith) of Laikingland.

2 INTRA-CURRICULAR PROJECT - METHODOLOGY

The live projects with Waldemeyer, Smith and the two members of staff, Jedwab and Zivanovic (Aleksandar Zivanovic) was titled ‘Interactive Automata’. Jedwab had met Smith in Milan, at the Furniture Fair, in a previous year and his work was very much in keeping with the style of project that we wished to create for the students because he designs automatons in an engaging and interactive way. Discussion of the project was via Skype, where it was decided that the students would design an interactive automaton using Arduinos and would be given three choices of themes: Labour-saving

Devices, Fantasy and Travel. The project was a way of encouraging the development of their skills in physical computing, giving them experience of an in-house live project with two high profile designers, experience of live deadlines and the benefit of Waldemeyer and Smith's input. Smith was only able to visit once, as he lived in the North of England, but Waldemeyer was able to visit at the beginning, middle and end of the project in order to give input and feedback.

Waldemeyer's work was already known to the students via the guest lectures, but Smith inspired the students with an additional introductory lecture about his work with Automata. The students were then given basic Arduino training by Zivanovic introducing them to a range of sensors eg. light-dependent resistors, switches, force sensors and actuators, DC motors, servo motors and solenoids. The students had to come up with a creative way of combining their new-found skills with the brief in groups of 3 or 4. The deliverable outcome was mock-ups and sketches, followed by a working prototype and a thirty second video demonstrating the moving automaton. The students were very engaged with the live project.

The outcome of the project was an even spread of assessment marks. This aligns to Level 5 outcomes as defined in the table below [5]:

Table 1 Framework for Higher Education Qualifications in England, Wales and Northern Ireland.

FHEQ Level	Equivalent to university year	Learning accredited at this level will reflect the ability to:
4	**1st year undergraduate**	Develop a rigorous approach to the acquisition of a broad knowledge base; employ a range of specialised skills; evaluate information using it to plan and develop investigative strategies to determine solutions to a variety of unpredictable problems; and operate in a range of varied and specific contexts, taking responsibility for the nature and quality of outputs.
5	**2nd year undergraduate**	Generate ideas through the analysis of concepts at an abstract level, with a command of specialised skills and the formulation of responses to well defined and abstract problems; analyse and evaluate information; exercise significant judgement across a broad range of functions; accept responsibility for determining and achieving personal and/or group outcomes.
6	**3rd year undergraduate**	Critically review, consolidate and extend a systematic and coherent body of knowledge, utilising specialised skills across an area of study; critically evaluate new concepts and evidence from a range of sources; transfer and apply diagnostic and creative skills and exercise
7	**Masters level**	display mastery of a complex and specialised area of knowledge and skills, employing advanced skills to conduct research, or advanced technical or professional activity, accepting accountability for related decision making including use of supervision

3 EXTRA-CURRICULAR PROJECTS - METHODOLOGIES

3.1 Mercedes CLS

For this project, Waldemeyer had designed an advertisement based on bullet-time (as seen in the Matrix films). Olympus had sponsored the project by providing fifty Pen cameras that were lined up in an arc, with all cameras focused on an identical point. The cameras were then linked to a single control point so that all shutters were released together. As a result, fifty different points of view were shot simultaneously and the bullet-time effect was enabled by editing the images together so that they gave the impression of circling a point of space in frozen time. Students built the circuit boards and interconnecting wires between the cameras and also worked on the production of 'light wands' with the lit part shaped like the headlights of the car, which are made from a series of programmable LEDs that blink on and off very fast, so that when the wand is waved, an image is formed through POV (persistence of vision). Students helped to solder and program the CLS images that appeared on the video around the new CLS car that was being promoted. The advertisement subsequently appeared on the Mercedes website, showing the 'making of' the advertisement, including appearances by our students.

Fig. 1 Students setting up the camera rig for 'bullet-time' on the Mercedes CLS advertisement© François Falcoz, 2009.

3.2 Ellie Goulding 'Lights' video

This video was commissioned based on Waldemeyer's work with Mercedes in 'bullet-time' and was for (Goulding's) Ellie Goulding's new album, 'Lights' [6], for which she had won a Critic's Choice Award at the Brit Awards in 2010. A single from the album, with the same title, 'Lights', was made into a video based on the bullet-time theme, but the symbols used for the light wands were a light bulb, a house, a phone and some abstract patterns. Other light effects included bouncing coloured balls across the room, using a laser platform to shine red lights on Goulding and lasers strapped onto the end of drumsticks.

The students were involved in every aspect of the set-up and some even dressed in blackout costumes so that when they ran with the lit balls, they could not be seen on camera. One female student was the stand-in for testing effects with Goulding as she was blond and roughly the same size. As a result of participation in the making of this video, the students were interviewed on the ITV news, which brought positive publicity to the University and more than 97 million hits of the video on You Tube.

Fig. 2 The making of Ellie Goulding's video for her 'Lights' single © Moritz Waldemeyer.

3.3 Take That jackets

The jackets for Take That were created for the single 'Love, Love' at the Progress Tour in 2011. Three students were placed in Waldemeyer's studio to work on the jackets that *had a specific structure of LEDs to perform its programmed sequence* (Graduate DJ, cited in [4]). There were 400 LED lights on each video-capable jacket and the students were *responsible for the individual programming, testing and bonding of each and every single LED to later be attached on the jackets*. One student went on tour with the group in order to ensure the jackets remained in good working order. The three projects described so far were all level 5 projects and used skills appropriate to that level.

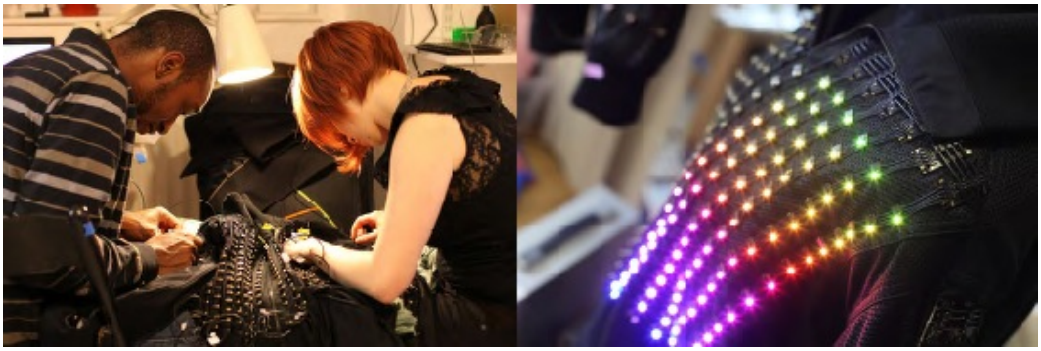

Fig. 3 Students soldering LEDs together for Take That jackets project © Moritz Waldemeyer and students.

3.4 Electrabel

This small project was similar to the Take That jackets except the LEDs were programmed to advertise Electrabel, a Belgian energy corporation, via a series of comical advertisements for an extensive campaign. Only one student was involved, but this was one of several extra mini internships for our students with Waldemeyer, including an internship to program Philip Treacy hats with lighting effects for London Fashion Week 2012, a lighting project for Ron Arad and another for Hugo Boss. Once the contact and trust had been established, our students were the point of first call for Waldemeyer.

Fig. 4 Electrabel advertisement © Moritz Waldmeyer.

3.5 Gaussian Blur After-Party in Milan

This was a somewhat more ambitious project that was allocated to the students. Bombay Sapphire had accepted a pitch from Waldemeyer and Dussopt (Florian Dussopt) to create a Designer 'After Party' to run for three consecutive nights in trendy Via Tortona in Milan in April 2012, as many parties finish early in Milan during the Furniture Fair and it was designed to take place from 10pm till 2am. *It incorporates the perfect balance between a club experience and a networking event* [7].

This was the perfect opportunity to create an installation as a focal point for the event that consisted of a hanging sculpture six metres high - the full height of the space, in order to create impact - with an artistic arrangement of animations and lights projected onto it. The famous photographer, James Harris, ran the DJ'ing sets. Jedwab negotiated a cross-school collaboration that involved Fashion, Animation and Product Design students. The students used the Middlesex University workshops to create a large number of laser-cut hanging bottles in the shape of Bombay Sapphire bottles, which were made of Perspex. These hung inside the sculpture, which was made of carbon fibre hoops, held apart by fabric stretched between them as a 'skin'. The hoops were made in the workshops and the fashion students used their pattern-cutting skills to cut the cloth to fit the staggered rings and attach the fabric. The animation student devised a series of animations to be projected onto the sculpture and the wall behind it. The students were able to go to Milan to construct the installation in situ. Jedwab oversaw the project but allocated a PhD student from Middlesex University who was studying

for a PhD in the department, to supervise the making of the sculpture. The animation student also created a time-lapse movie of the building of the installation. During the party, a reporter interviewed event participants around the installation and asked them to nominate their highlights of the Milan Design Festival. These were edited and uploaded daily on Facebook and on the Bombay Sapphire website, thus utilizing online media to promote the event.

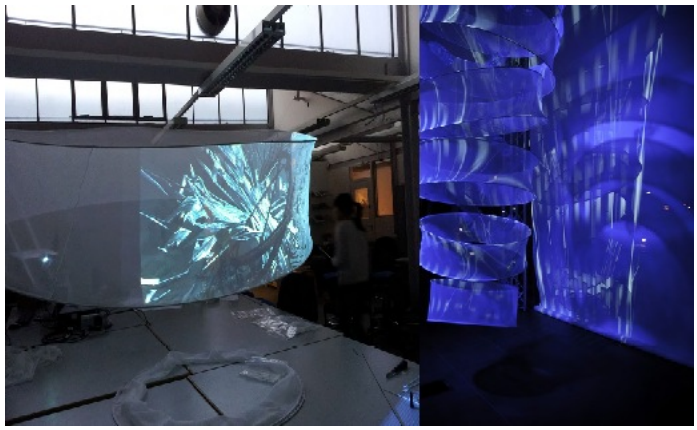

Fig. 5 Development of the Gaussian Blur installation in Middlesex University workshops and in situ in Milan © Moritz Waldmeyer and students.

3.6 Olympics 2012 Closing Ceremony and Paralympics

This project was the culmination of all the projects that had gone before. Ten students, project managed by the PhD student from the Gaussian Blur project, were massively involved in the biggest show on earth – the 2012 Olympics. Jedwab knew both Waldemeyer and also the designer of the Olympic Closing Ceremony, Nakao (Jum Nakao), a Japanese designer living in Brazil. He designed the handover ceremony (from London) to Brazil for the 2016 Olympics which took place as part of the Closing Ceremony 2012. The students' role was to develop many complex systems. There were 140 costumes, designed by Nakao, involved, that all needed LED features. The costumes and headdresses ran patterns, synchronized using synchronization tones embedded in the event FM transmission. The students also worked on the Paralympics, building other lighting effects. This was about two months' work, quite a bit of it in situ. The students lived in a rented house on site and worked around the clock to complete everything on time.

Fig. 6 Olympics Closing Ceremony © Moritz Waldemeyer.

4 THE KNOCK ON EFFECT OF WORKING WITH MORITZ WALDEMEYER IMOGEN HEAP - 'THE LISTENING CHAIR'

This project was a commission by Heap (Imogen Heap). She contacted Waldemeyer to produce a modified chair with a visor that would be used to create a mini-TV studio. After discussion with Waldemeyer, three students were allocated to work on the project, the PhD student and two Product Design students who worked well together as a team. The pod was a reproduction egg chair in 1960s style that was modified by the students involved. They had to build a platform in which to hide the electronics and amplifiers, and fit speakers into the body of the chair. Cabling was run down to the platform which had a water-jet cut base plate made from stainless steel with 'The Listening Chair' cut out of it. Members of the public sat in the chair, closed the visor, listened to a track and give a video interview, telling Heap what song they wanted her to write. It was essentially an experiential pod. As a result of this research, Heap wrote the single, 'The Listening Chair', which appears on her album, 'Sparks' [8]. The student team involved are credited on the Deluxe version of the album, where each single has its own individual sleeve. Initially the chair was only to be used on the South Bank as part of the London Design Festival, but eventually it travelled to as far as Australia on a world tour, and considering it had not been designed for global use, it survived the trip well. It recently appeared again at the Reverb Festival at the Camden Roundhouse organised by Heap (2014).

Fig. 7 Moritz Waldemeyer with the Middlesex University student team and Imogen Heap's team with The Listening Chair (minus the front visor) © Imogen Heap.

5 COMPARISON OF LIVE PROJECTS TO CURRICULUM FRAMEWORK

It was entirely in keeping with the Framework for Higher Education for Qualification [5] that the students in Level 5 were initially helping on projects with a smattering of autonomous input, graduating to more and more self-directed project management under the creative direction of Waldemeyer and tutors, graduating through Levels 6 up to Level 7 for the PhD student who managed the team for the Olympics and Paralympics. The students were able to understand team roles and playing to peoples' strengths effectively, having had this training throughout their University education.

Examples of this can be seen in the Framework for level 5, in particular where students have *accepted responsibility for determining and achieving personal and/or group outcomes* [5]. More complex projects later on used skills expected at Level 6 such as *consolidate and extend a systematic and coherent body of knowledge, utilizing specialized skills across an area of study* [5].

On reflection, students recognized the benefits of these experiences at Level 5:

> *"New skills learnt: project management, furthered building skills, design implementation and client interaction." (Graduate MO, cited in [4])*
>
> *"There are a number of skills that I learnt whilst at Middlesex University which I utilized while working with Moritz including creative problem-solving, how to work in a team of people from different backgrounds and different specialisms as well as practical skills such as soldering, programming and power management." (Graduate RB, cited in [4])*
>
> *"For me it was the rapid gain of confidence in being able to communicate in a professional way. I was brimming with confidence having completed work on the*

Olympics just before heading into my final year of Uni. I felt that I could make a real success of my final year and have an advantage over many in my year group through gaining such experience." (Graduate DC, cited in [4])

and Level 6:

"I see live projects as an essential part of the course. It not only gives students a chance to work on exciting projects which they can add to their portfolios, but teaches them many skills they cannot get from taught sessions alone. For example, it enables them to learn communication skills, how to source materials and manufacturing services and implement many processes (sometimes in parallel) while working under time pressures, all in real world scenarios" (Graduate SO, cited in [4])

"Live projects with real world companies or designers who made it is the greatest experience anyone could hope for. Any student who has an ability to be in the process of making something side by side with someone who has been doing this for a long time is encouraging because it puts one on the right track of personal skills development." (Graduate MB, cited in [4])

In addition to the Learning Framework [5], it could be argued that the students who took part in the live projects engaged with Vygotsky's learning style [9] where Waldemeyer played the *More knowledgeable Other,* following in the path of their intra-curricular Design Projects where staff play a role of *cooperative or collaborative dialogue* with students to develop the students' competencies and confidence. The style of working and learning also resonates with Scaife and Rogers *et al.* [10] *'participatory design' approach…to respect users more as partners in the design process and in doing so explicitly give them a more equal and responsible role. In this way users can jointly work together with the designers to develop a system to fit their needs.'* This was certainly the case with the latter projects, for example the Olympics 2012.

6 EFFECTS OF THE ASSOCIATION WITH MORITZ WALDEMEYER ON STUDENTS DURING AND AFTER UNIVERSITY

All students that had taken part in the intra- and extra-curricular projects with Waldemeyer were sent a questionnaire in order to reflect on their experience of the live projects. Their experiences were very positive and they all felt that the live projects had been instrumental in their employability prospects, giving them the edge over other Product Design graduates that had completed their Undergraduate degrees without any kind of work experience:

"It provided me with the experience that employers always ask for when advertising a role. It shows employers that you are already familiar and capable of working in the professional world and adds some interesting and high level names to a CV, making it stand out." (Graduate PJ, cited in [4])

"I would definitely agree that the high profile projects that I was involved with have given credibility to my portfolio. They demonstrate that I can successfully deliver projects for big clients and events" (Graduate SO, cited in [4])

"After working with Moritz I freelanced on a number of design projects before co-founding a company that specializes in design, engineering and robotics." (Graduate RB, cited in [4])

"When doing LPs it made me be aware of what my skills were, what I was good at and what I was bad at. This gave me the opportunity to enhance the skills I had and improving those I struggled with. It gave me the confidence to speak up both at Uni and during projects when I had ideas." (Graduate PV, cited in [4])

"I think experience is very important especially at University level, as it can have a positive effect on a student's immediate work within University, open up their prospects as well as build the necessary confidence to diversify and compete in an industry full of opportunities." (Graduate KW, cited in [4])

It was an important lesson for the students too, to manage their expectations of the client in terms of their input, what they are expected to achieve themselves and to find resourceful solutions to real live problems when working to immovable deadlines such as the Olympics. It is also important for external designers to understand that they are working with students who are still learning their craft and

therefore, although these particular students performed to a very high level of competency, it should be kept in mind that they are still learning and therefore outcomes may not necessarily be of the standard they would hope for. All the students involved gained a 2:1 or 1 degree but other factors may have contributed to this as well as the live projects experience.

It is also important to note that as the projects that students were involved with became more ambitious, staff were able to co-ordinate cross-School collaborations with other departments such as Fashion and Animation for the Gaussian Blur project, thus capitalizing on the talent pool from different sectors of the University in a holistic way.

As a report in 2012 [11] states that *Graduates Prospects highlights that approximately 35 percent of design graduates do find a design-related occupation*, it is notable that a high level of employability is seemingly enhanced by the live projects. None of the participants in the live projects with Waldemeyer are unemployed and all are working in the field of design. Their experiences at University helped them to *acquire industry work culture* [12].

Students who took part in these live projects have gone on to follow a number of different routes: two stayed at the University as Graduate Teaching Assistants and are in the process of taking Masters Degrees; one launched a Kickstarter project of a quadcopter that is also a land vehicle; several set up their own design studios, two of the participants setting up together with complementary skills of robotics, design and engineering; three are working at Dyson; a number had successful internships with other well-known designers - one programmed a Robotic Arm for Ted Noten's Ladykiller installation in Milan 2012 through the contact with Smith; one is working as a freelancer for MW, one is doing a PhD in Engineering, two others are working as a product designers and one is Head of User Experience for a global company of 150+ people.

Waldemeyer and Dussopt, who co-designed the Gaussian Blur party in Milan, are now both designers in residence at Middlesex University and are continuing their ongoing collaborations with us.

7 CONCLUSIONS

Recommendations for working with outside designers on live projects would be the following:

- On reflection, three years after graduating, students recognized the way in which working on external projects enhanced their employability, especially by having a high profile designer on their CVs.
- Useful taught skills for the students involved were their technical abilities, their ability to problem solve, resourcefulness, prototyping and testing and considerations for volume production of components to a greater degree than they would have done at University. They learnt through experience to liaise with clients, source parts, time manage to immovable deadlines and work to problem solve to a higher degree.
- The nature of working with external practitioners is that University staff need to be in a position to capitalize on good contacts. In this instance, the scenario worked as a three way system: (a) lecturer(s)/placement manager/projects manager with (b) students and (c) outside party/design collaborator. The opportunities gained for the students were a direct result of meeting Waldemeyer, inviting him into the University for a guest lecture and developing the contact to extend to an intra-curricular live project. It was then further developed to provide students as interns to work alongside Waldemeyer for small projects as extra-curricular activities (extra-curricular live projects). This eventually led to the students working on the Olympics and Paralympics in a semi-autonomous way, just overseen by the creative director.
- Contact with a client is sporadic and students need to manage their expectations of the client as well as themselves.
- An open door policy from the tutors involved has been instrumental in forming good relationships with the students and getting to know their strengths and weaknesses in order to place the students with matching skills to any prospective extra-curricular project. The process of working with an outside designer needs to be closely managed and must also fulfill the learning outcomes of the degree that they are studying. It is also important that the work is supported by the flexibility of technical staff, to allow prototyping and manufacturing at short notice. Nothing works without a team effort.

- Liaison with Middlesex University Coporate Marketing and Communications department was instrumental in publicizing the work that Middlesex University students had participated in and as a result the students were promoted on prime time ITV News and in multiple newspaper articles and journals. The publicity of the projects was one of a number of factors contributing to healthy recruitment numbers for the BA Product Design and BSc Product Design courses during those years and was helpful with the employability of the students when it appeared on their CVs.

This paper has examined the working collaboration live projects between staff, students of Middlesex University and the designer Waldemeyer and examined the way in which the relationship has developed over a number of years, culminating in the Olympic Closing Ceremony and Paralympics. It has also examined the opportunities that the live projects afforded students when applying for work as Graduates.

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